PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing (day/month/year)	**19 MAR 1998**

Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
42390.P3313	

International application No.	International filing date (day/month/year)	Priority Date (day/month/year)
PCT/US96/20522	17 DECEMBER 1996	19 DECEMBER 1995

Applicant

INTEL CORPORATION

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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

   The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

   Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

   For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

NO DOCKETING

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MAR 2 6 1998

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Form PCT/IPEA/416 (July 1992)*

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 42390.P3313	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US96/20522	International filing date *(day/month/year)* 17 DECEMBER 1996	Priority date *(day/month/year)* 19 DECEMBER 1995

International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.

Applicant INTEL CORPORATION

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of __2__ sheets.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

   I ☒ Basis of the report

   II ☐ Priority

   III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability

   IV ☐ Lack of unity of invention

   V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI ☐ Certain documents cited

   VII ☒ Certain defects in the international application

   VIII ☒ Certain observations on the international application

Date of submission of the demand 02 JULY 1997	Date of completion of this report 03 FEBRUARY 1998
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer PARSHOTAM LALL Telephone No. (703) 305-9715

I. Basis of the report

1. This report has been drawn on the basis of *(Substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments)*:

[X] the international application as originally filed.

[X] the description, pages <u>1-129</u>, as originally filed.

pages <u>NONE</u>, filed with the demand.

pages <u>NONE</u>, filed with the letter of _____.

pages _____, filed with the letter of _____.

[X] the claims, Nos. <u>1-100</u>, as originally filed.

Nos. <u>NONE</u>, as amended under Article 19.

Nos. <u>NONE</u>, filed with the demand.

Nos. <u>NONE</u>, filed with the letter of _____.

Nos. _____, filed with the letter of _____.

[X] the drawings, sheets/fig <u>1-20</u>, as originally filed.

sheets/fig <u>NONE</u>, filed with the demand.

sheets/fig <u>NONE</u>, filed with the letter of _____.

sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

[X] the description, pages <u>NONE</u>.

[X] the claims, Nos. <u>NONE</u>.

[X] the drawings, sheets/fig <u>NONE</u>.

3. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the ~~Supplemental Box~~ Additional observations below (Rule 70.2(c)).

4. Additional observations, if necessary:

NONE

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US96/20522

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Inventive Step (IS)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Industrial Applicability (IA)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO

2. CITATIONS AND EXPLANATIONS

1.   Claims 1-7, 12, 15-17, 32-33, 52, 62-69 and 74 lack an inventive step under PCT Article 33(3) as being obvious over Cocke et al (U.S. Patent No. 4,992,938).

a.   As to claim 1, Cocke discloses a processor comprising : a mapping unit (figure 2 and figure 4 reference number 700; column 4 lines 57-63) coupled to a decode unit (figure 2 reference number 400) and a storage unit (figure 4 reference number 800, 900, and 1000; column 4 line 65 to column 5 line 36), configured to map operand used by a set of instructions to a physical register file in a stack referenced manner (use stack pointer) or non-stack referenced manner (load, store, use queue pointer) (column 2 line 42 to column 3 line 2 and column 5 line 61 to column 6 line 33); and a storage unit, coupled to the mapping unit, including the physical register file (column 10 lines 44-47, 50-52, and 62-63). However, Cocke does not explicitly disclose decode unit configured to decode instructions and their operand. A decode unit is well-known and decode instructions and their operand would have been obvious in the art at the time the invention was made.

b.   As to claim 2, Cocke discloses that the mapping unit including a set of tags, each tag in the set of tags corresponding to a different register in the physical register file (column 10 lines 22-24). However, Cocke does not explicitly disclose that identifying if the corresponding register is in an empty or a non-empty state. But, it would have been obvious to one of ordinary skill in the art at the time the invention was made.

c.   As to claim 3, it would have been obvious to one of ordinary skill in the art at the time the invention was made to keep the set of tags to the non-empty state when (Continued on Supplemental Sheet.)

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1. The figures 8, 11A-11C and 13 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof:

Figure 8 include the following reference sign(s) not mentioned in the description : step 920.

Figures 11A-11C do not include the following reference sign(s) mentioned in the figure 13 : step 1140 & step 1142.

figure 13 include the following reference sign(s) not mentioned in the description : step 1140 & step 1142.

Correction is required.

2. The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof:

There is no brief description for figure 12C in the specification.

Correction is required.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1.   Claims 3 and 66 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims 3 and 66 are indefinite for the following reason(s):
         Claim 3 contains "...sometime..." in lines 3 and 6 which is unclear about time and also claim 3 is unclear about a set of transition instructions. Same arguments applies to claim 66.

2.   Claims 2 and 65 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims 2 and 65 are indefinite for the following reason(s):
         Claim 2 contains in line 3 "...corresponding to corresponding a...". Same arguments applies to claim 65.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(6):　G06F 9/00, 9/30, 9/32, 9/34, 9/38, 9/40, 12/00, 12/02, 7/48
US Cl.:　395/376, 378, 384-386, 390-393, 412, 413, 496, 561-564, 587, 800.23, 800.32-800.34, 800.41, 800.42; 364/747, 748

V. 1. REASONED STATEMENTS:

The report as to Novelty was positive (YES) with respect to claims 1-100.

The report as to Novelty was negative (NO) with respect to claims NONE .

The report as to Inventive Step was positive (YES) with respect to claims 8-11, 13-14, 18-31, 34-51, 53-61, 70-73, and 75-100.

The report as to Inventive Step was negative (NO) with respect to claims 1-7, 12, 15-17, 32-33, 52, 62-69, and 74.

The report as to Industrial Applicability was positive (YES) with respect to claims 1-100 .

The report as to Industrial Applicability was negative (NO) with respect to claims NONE.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):
a set of instructions is not executed after a previous set of instructions.

　　d.　　As to claims 4-5, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the set of tags to the empty state in response to the processor receiving a set of instructions and the non-empty state in response to the processor receiving at list one of the set of instructions.

　　e.　　As to claim 6, Cocke discloses that the storage unit further includes a second physical register file (figure 4 reference number 800, 900, and 1000; column 4 line 65 to column 5 line 36 and column 10 lines 44-47, 50-52, and 62-63); and the mapping unit initially maps operand used by instructions to a set of buffer registers (FREE_LIST) (figure 4 reference number 1000) and the storage unit retires those operand from the second physical register file to the first physical register file (figure 4; column 10 lines 36-66).

　　f.　　As to claim 7, Cocke discloses a set of buffer registers (FREE_LIST) (figure 4 reference number 1000), but Cocke does not disclose that the set of buffer registers is a plurality of reservation stations. Clift discloses a reservation station (figures 1 and 13 reference number 75) which receives the renamed sources and destinations (column 11 lines 25-29 and column 50 lines 10-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a reservation station of Clift in the processor of Cocke to store pending errors from previous instructions because it would improve utilization of the processor.

　　g.　　As to claims 12 and 15, Cocke discloses that the mapping unit is also configured to map operand used by a new set of instructions to a new physical register file in a stack referenced manner (use stack pointer) (column 2 line 42 to column 3 line 2 and column 5 line 61 to column 6 line 33) contained in the storage unit (column 10 lines 44-47, 50-52, and 62-63).

　　h.　　As to claim 16, Cocke discloses that operand used by the sets of instructions are at least partially aliased on the physical register file (see abstract).

　　i.　　As to claim 17, lack of inventive step of the claim 1 equally apply here. Additionally, Cocke discloses a first unit (register file-figure 1 reference number 24) including a physical register file; and a second unit (register renaming-figure 1 reference number 20), coupled to the decode unit (figure 2 reference number 600) and the first unit (figures 1-2; column 9 lines 7-46).

　　j.　　As to claims 32-33, Cocke discloses a execution (arithmetic) unit (figure 1 reference number 22), coupled

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII   Sheet 11

to the second (register renaming) unit (figure 1 reference number 20) and register file; and the execution unit writes operand to as a result of executing instructions from the set of instructions (figure 1; column 4 lines 10-37 and column 9 lines 7-22).

l.   As to claims 52 and 62-63, lack of inventive step of the claims 17 and 32-33 equally apply here. For example, claim 52 corresponds to claim 17, claim 62 corresponds to claim 32, and claim 63 corresponds to claim 33.

m.   As to claims 64-69 and 74, lack of inventive step of the claims 1-6 and 12 equally apply here. For example, claim 64 corresponds to claim 1, claim 65 corresponds to claim 2, claim 66 corresponds to claim 3, claim 67 corresponds to claim 4, claim 68 corresponds to claim 5, claim 69 corresponds to claim 6, and claim 74 corresponds to claim 12.

2.   Claims 8-11,13-14, 18-31, 34-51, 53-61, 70-73, and 75-100 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a superscalar microprocessor concurrently perform scalar floating point, packed (vector) floating point, scalar integer, and packed (vector) integer operations.

———————— NEW CITATIONS ————————
NONE